IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Previously Presented): A photon source configured to allow emission of a predetermined number of photons at predetermined times comprising:

a quantum dot having a first confined energy level capable of being populated with a first carrier which is an electron and a second confined energy level capable of being populated by a second carrier which is a hole; and

electrical supply means for supplying carriers to the energy levels, wherein the supply means are configured to electrically supply a predetermined number of carriers to at least one of the energy levels to allow recombination of carriers in said quantum dot to emit at least one photon.

Claim 2 (Previously Presented): The photon source of claim 1, wherein the supply means are configured to repetitively supply a predetermined number of carriers at a predetermined time to the at least one energy level to allow emission of a predetermined number of photons at predetermined time intervals.

Claim 3 (Previously Presented): The photon source of claim 1, wherein the supply means are configured to repetitively supply a single carrier to the at least one energy level to allow emission of a single photon separated from each other by predetermined time intervals.

Claim 4 (Previously Presented): The photon source of claim 1, comprising a plurality of quantum dots.

Claims 5-16 (Canceled).

Claim 17 (Previously Presented): The photon source of claim 1, wherein the supply means comprises means to electrically inject a predetermined number of carriers into the other of said energy levels.

Claim 18 (Previously Presented): The photon source of claim 1, wherein the carriers are injected into the other of said energy levels at the energy of said other energy level.

Claim 19 (Previously Presented): The photon source of claim 1, wherein the source has an output surface through which the emitted photons are collected, the source further comprising coupling means for coupling the emitted photons to a fiber optic cable.

Claim 20 (Previously Presented): The photon source of claim 1, wherein the source has an output surface through which the emitted photons are collected and comprises an anti-reflection coating located on said output surface.

Claim 21 (Previously Presented): The photon source of claim 1, wherein the source further comprises a lens for collecting emitted photons.

Claim 22 (Previously Presented): The photon source of claim 1, wherein the source comprises a mirror cavity having a mirror located on opposing sides of said quantum dot.

Claim 23 (Original): The photon source of claim 22, wherein the source has an output surface through which the emitted photons are collected and said mirror closest to said output surface is partially reflective such that it can transmit the emitted photons.

Claim 24 (Original): The photon source of claim 22, wherein the energy of the cavity mode for said mirror cavity is substantially equal to that of the emitted photons.

Claim 25 (Original): The photon source of claim 22, wherein the distance between the two mirrors L_{cav} bounding the cavity is defined by the equation:

$$L_{cav} = \frac{m\lambda}{2n_{cav}};$$

where λ is the wavelength of the emitted photons,

m is an integer and n_{cav} is the refractive index of the cavity.

Claim 26 (Original): The photon source of claim 22, wherein the spectral band-pass of the cavity is substantially equal to the spectral width of the radiation emitted from the dot in the absence of a cavity.

Claim 27 (Original): The photon source of claim 22, wherein the quantum dot is positioned at an anti-node of the standing wave pattern caused by said mirrors.

Claim 28 (Original): The photon source of claim 22, wherein at least one of the mirrors is a Bragg mirror comprising a plurality of alternating layers wherein each layer satisfies the relation

$$nt = \frac{\lambda}{4}$$

wherein λ is the wavelength of the emitted photons, n and t are the refractive index and thickness respectively of a layer within the mirror.

Claim 29 (Original): The photon source of claim 22, wherein a mirror comprises a metal layer and a phase matching layer.

Claim 30 (Previously Presented): The photon source according to claim 1, wherein the source further comprises an optic fiber cable for collecting the emitted light.

Claim 31 (Previously Presented): A photon source according to claim 29, wherein a wavelength of a fiber optic cable is substantially equal to a wavelength of a cavity mode.

Claim 32 (Previously Presented): The photon source of claim 30, wherein the optical fiber has a non-reflective coating.

Claim 33 (Previously Presented): The photon source of claim 1, wherein the source further comprises a filter configured to select emitted photons of a particular energy.

Claim 34 (Previously Presented): The photon source of claim 1, wherein the source further comprises a polarizer configured to select emitted photons of a particular polarization.

Claim 35 (Withdrawn): A method of fabricating a photon source, the method comprising:

forming a quantum dot layer by growing a layer of a first material on a second material, wherein there is a variation in the lattice constants between the first material and the second material, the first material being deposited in a layer which is thin enough to form a plurality of quantum dots,

the method further comprising providing supply means for supplying carriers to the said energy levels, wherein the supply means are configured to supply a predetermined number of carriers to at least one of the energy levels in the quantum dots to allow recombination of a predetermined number of carriers in said quantum dot to emit at least one photon.

Claims 36-55 (Canceled).

Claim 56 (Previously Presented): The photon source of claim 1, wherein said quantum dot is encapsulated between two layers having different lattice constants than the quantum dot.

Claim 57 (Previously Presented): A photon source configured to allow emission of a predetermined number of photons at predetermined times comprising:

a quantum dot having a first confined energy level capable of being populated with a first carrier which is an electron and a second confined energy level capable of being populated by a second carrier which is a hole; and

supply means for supplying carriers to the energy levels, wherein the supply means comprises a source of pulsed incident radiation configured to resonantly excite a

predetermined number of carriers into the first and second energy levels respectively to allow recombination of carriers in said quantum dot to emit at least one photon,

wherein said quantum dot is encapsulated between two layers having different lattice constants than the quantum dot.

Claim 58 (Previously Presented): The photon source of claim 57, wherein the supply means comprises incident radiation configured to excite a predetermined number of electrons and/or holes into the first and second energy levels respectively.

Claim 59 (Canceled).

Claim 60 (Currently Amended): The photon source of claim [[59]] <u>57</u>, wherein a pulse has a duration which is less than a relaxation time of a carrier which said pulsed radiation excites in the quantum dot.

Claim 61 (Currently Amended): The photon source of claim [[59]] <u>57</u>, wherein a time between leading edges of successive pulses is greater than a recombination time of an electron and a hole in the quantum dot.

Claim 62 (Previously Presented): The photon source of claim 60, wherein a time between leading edges of successive pulses is greater than a recombination time of an electron and a hole in the quantum dot.

Claim 63 (Previously Presented): A photon source configured to allow emission of a predetermined number of photons at predetermined times comprising:

a quantum dot having a first confined energy level capable of being populated with a first carrier which is an electron and a second confined energy level capable of being populated by a second carrier which is a hole; and

supply means comprising a source incident radiation for supplying carriers to the energy levels, and modulation means for varying transition energies of the quantum dot,

wherein a predetermined number of carriers are resonantly excited into at least one of the energy levels when a transition energy of the quantum dot matches an energy of the incident radiation to allow recombination of carriers in said quantum dot to emit at least one photon, and

wherein said quantum dot is encapsulated between two layers having different lattice constants than the quantum dot.

Claim 64 (Previously Presented): A photon source configured to allow emission of a predetermined number of photons at predetermined times comprising:

a plurality of quantum dots having first confined energy levels capable of being populated with first carriers which are electrons and second confined energy levels capable of being populated by second carriers which are holes, the quantum dots having a distribution of transition energies such that a level of the first confined energy levels and/or the second confined energy levels differs among the quantum dots;

supply means for supplying carriers to the energy levels, wherein the supply means supply carriers to at least one of the first and second confined energy levels to allow recombination of carriers in said quantum dots to emit at least one photon; and

a filter configured to select photons of a particular energy emitted from just one quantum dot.

Claim 65 (Previously Presented): A photon source configured to allow emission of a predetermined number of photons at predetermined times comprising:

a plurality of quantum dots having first confined energy levels capable of being populated with first carriers which are electrons and second confined energy levels capable of being populated by second carriers which are holes, the quantum dots having a distribution of transition energies such that a level of the first confined energy levels and/or the second confined energy levels differs among the quantum dots; and

supply means for supplying carriers to the energy levels, wherein the supply means selectively inject or excite carriers of a predetermined energy into one of the energy levels of just one quantum dot to allow recombination of a predetermined number of carriers in said quantum dot to emit at least one photon.